PROJECT BRIEFING
PRINCIPAL DEPUTY ASSISTANT ADMINISTRATOR
OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE

Florida Phosphate Mine Initiative
Region 4, Superfund Division

March 8, 2010

U.S. Environmental Protection Agency

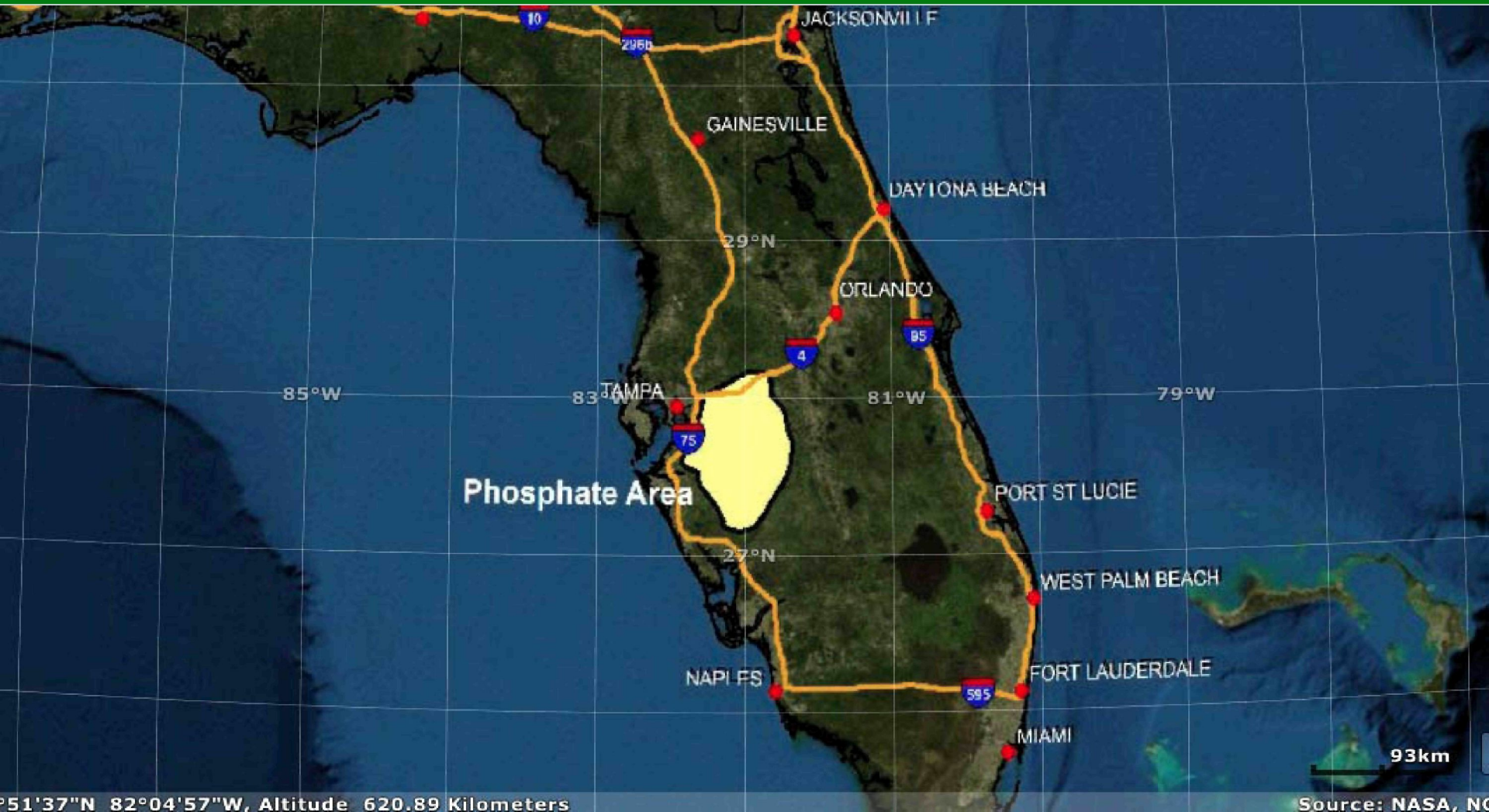
SUMMARY OF ISSUES

- Large number of phosphate mining related sites in CERCLIS.
- Little progress since the mid-1990's.
- 1999 GAO review of CERCLIS sites with "Unaddressed Risks." (Radiation risks first identified by EPA in 1979 Report.)
- Large number of similar sites in State inventory.
- Uncertainty regarding appropriate criteria for evaluating potential risk from elevated radiation.

BACKGROUND

- 2150 mi^2 phosphate deposit located in West-Central, Florida.
- Primary source of phosphate ore for U.S.
- Mining began in Florida in late-1800's.
- Ore contains natural levels of U^{238} and Ra^{226}.
- Mining and processing distributes radionuclides at landsurface (e.g., TENORM).

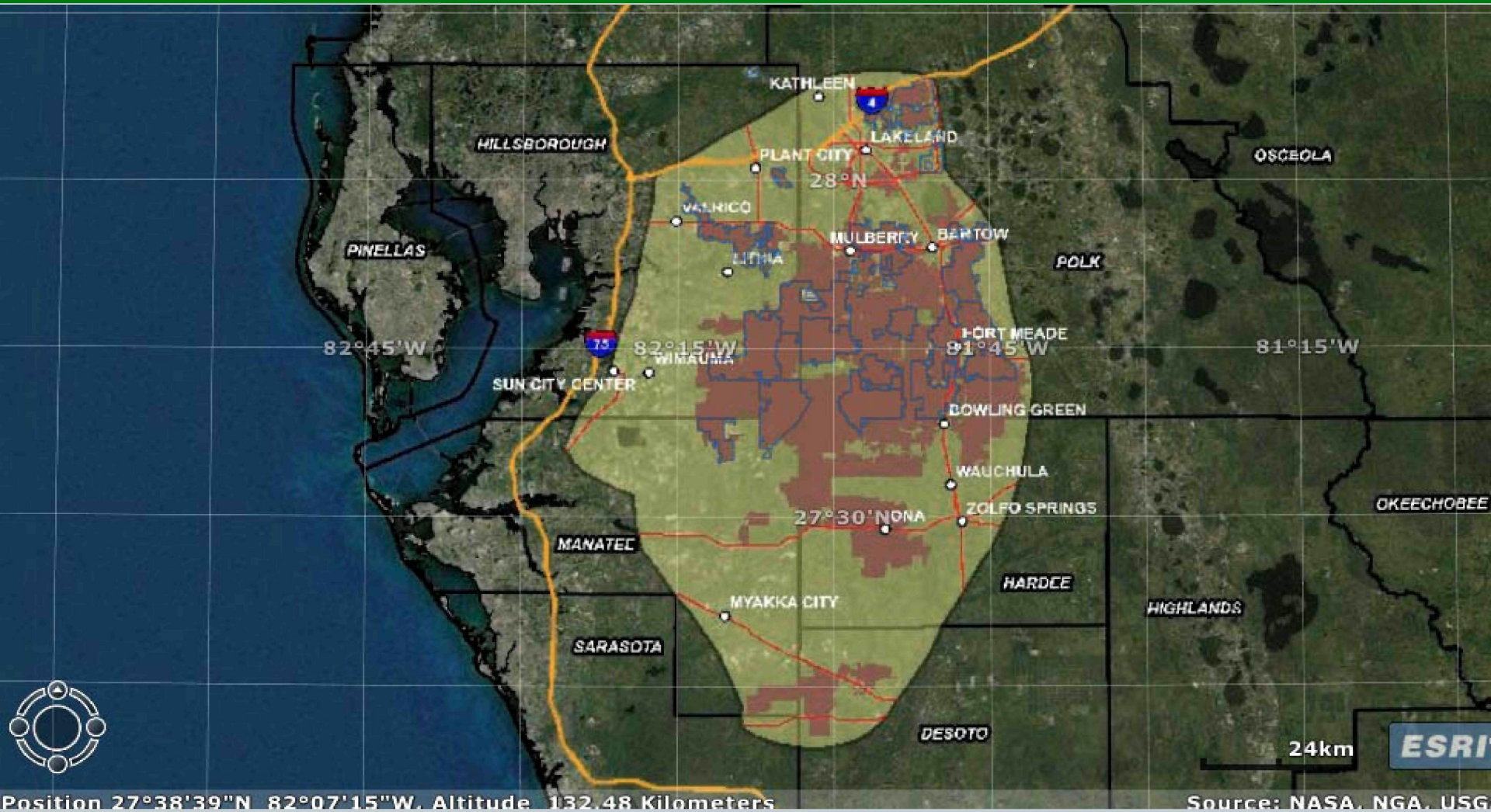
FLORIDA PHOSPHATE PROJECT LOCATION MAP



BACKGROUND (CONT.)

- 28 phosphate mining related sites in CERCLIS, spanning 337 mi^2 area.
- An additional 550 mi^2 of phosphate mine related land in Florida not included in CERCLIS.
- Florida mine reclamation laws generally limited to physical restoration of land-surface and hydrology.
- Florida mine reclamation laws do not address TENORM.

EXTENT OF ALL MINING



BACKGROUND (CONT.)

- Much of the formerly mined land has been developed for residential, commercial, industrial, and recreational purposes.
- Two CERCLIS sites identified with residential developments (~900 homes).
- Residential use on “non-CERCLIS” phosphate mining land estimated at 7000 acres (~28,000 homes).
- EPA and State data suggests radiation levels may pose excess cancer risk up to 10^{-2} .

EPA INVOLVEMENT

- Project began in 2000 in response to GAO review of CERCLIS sites with “unaddressed risks.”
- 1979 EPA study documented elevated levels of radon gas and gamma radiation.
- Multiple meetings among EPA, FDEP, FDOH, and ATSDR.
- Significant efforts devoted to reconciling uncertainty regarding appropriate response criteria.
- Response Criteria Discussed:
  - EPA: Risk based and ARAR (5 pCi/g, above background (1 pCi/g)) (~ 5 x 10^{-4} risk),
  - FDEP: No criteria for radiation or radionuclides in soil,
  - FDOH: 500 mRem/yr,
  - ATSDR: 100 mRem/yr.

STATUS OF CURRENT ISSUES

- CERCLA assessment and cleanup criteria (i.e., 10^{-4} risk level and 5 pCi/g ARAR) not supported by State.
- Florida's regulatory involvement at one of the CERCLIS sites has prompted the State to consider whether or not radiation and radionuclides should be evaluated as chemicals and meet Florida's 10^{-6} risk-based level. (Background currently 10^{-4})
- Assessment of CERCLIS sites to require radiological investigation of residential and other developed areas.
- Development of Communication Strategy and Community Engagement Strategy key to project.

CURRENT REGIONAL PLANS

- Brief State and HQ on project status and future plans.
- Seek additional HQ funding for phosphate projects.
- Proceed with individual assessment work for phosphate mine-related CERCLIS sites.
- Proceed with radiological assessments in residential areas to complete Coronet RI.
- Proceed with PRP search, enforcement-lead ESI/RI, and CI plan development at Tenoroc; Sydney; and W.R. Grace/Bonnie Lake mine sites.
- Start ESI/RI projects at 3 to 5 phosphate mine-related CERCLIS site each year.
- Develop Communication Strategy and Community Engagement Strategy.

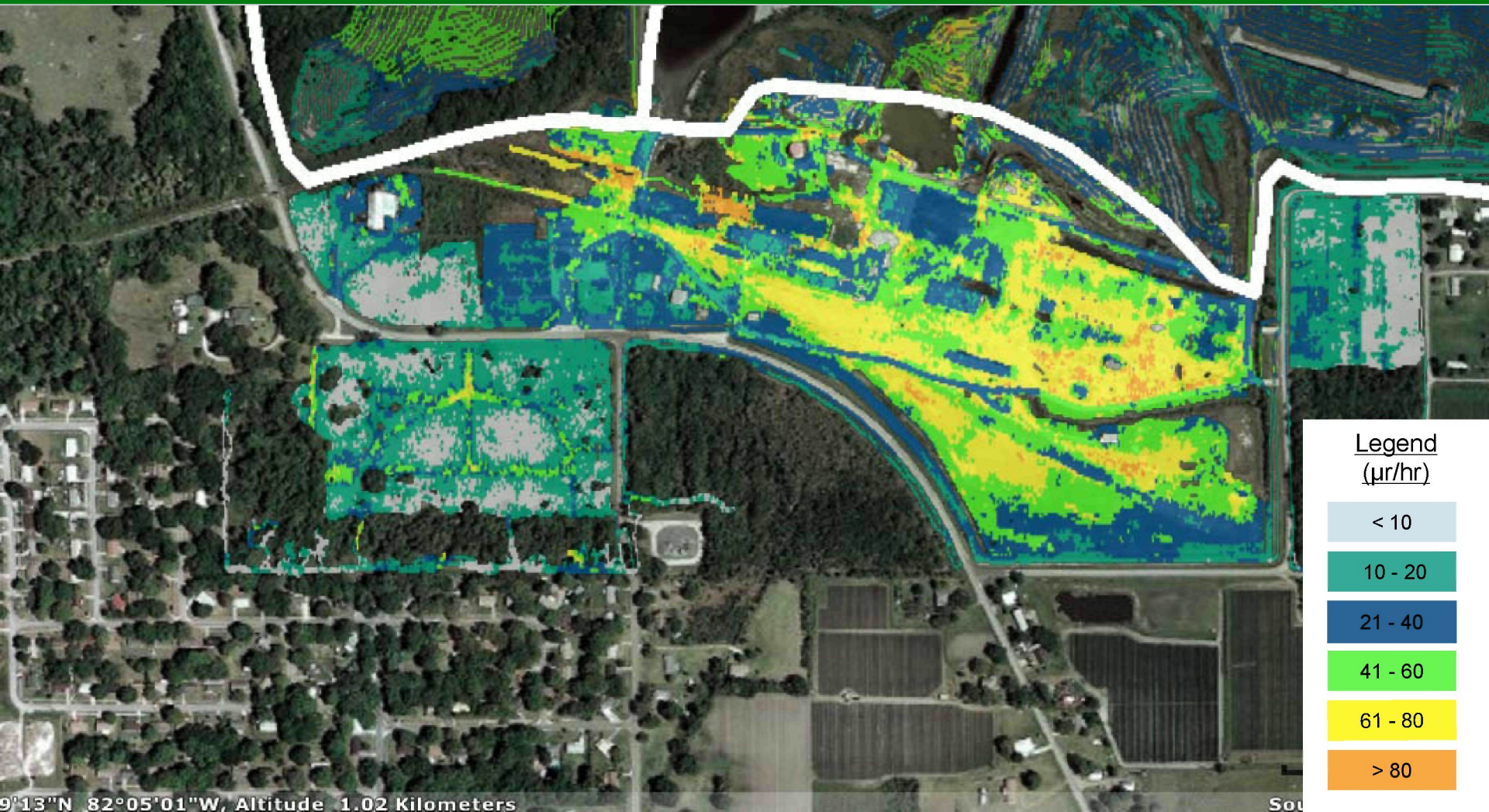
QUESTIONS AND DISCUSSION

SUPPLEMENTAL SLIDES

CORONET INDUSTRIES, INC (RI/FS)

- Ground-based radiation survey conducted over accessible portions of 980-acre portion of Site.
- Results indicate elevated radiation levels over much of Coronet property.
- Concern for possible radiological impacts in adjacent residential areas.
- Background monitoring at Loyce E. Harpe Park (former mine area) indicated radiation levels ranging from 34 to 140 µr/hr. (No measurements at “care-taker” residence.)

CORONET RADIATION SURVEY RESULTS

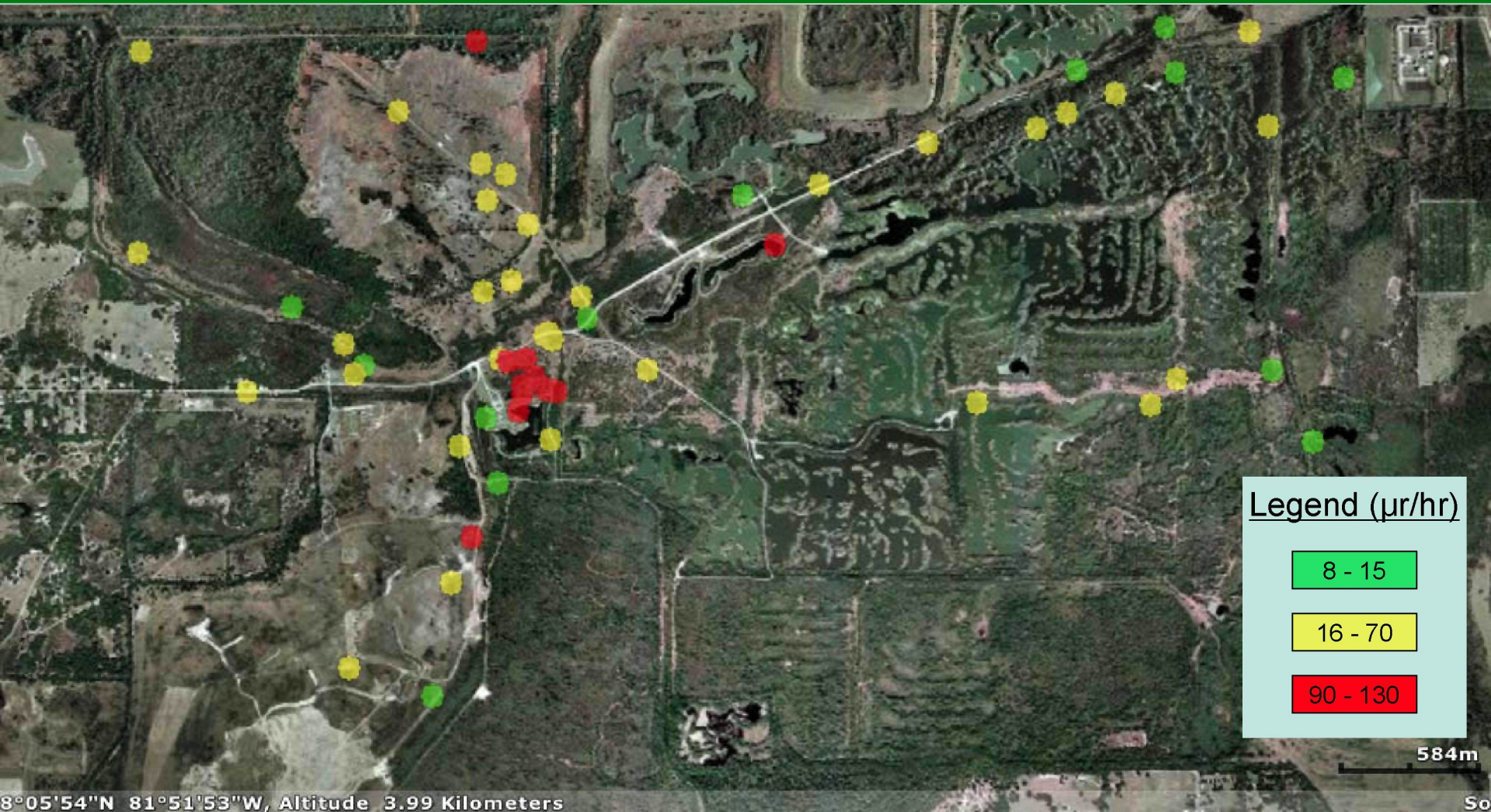


CORONET AND POTENTIAL EJ COMMUNITY

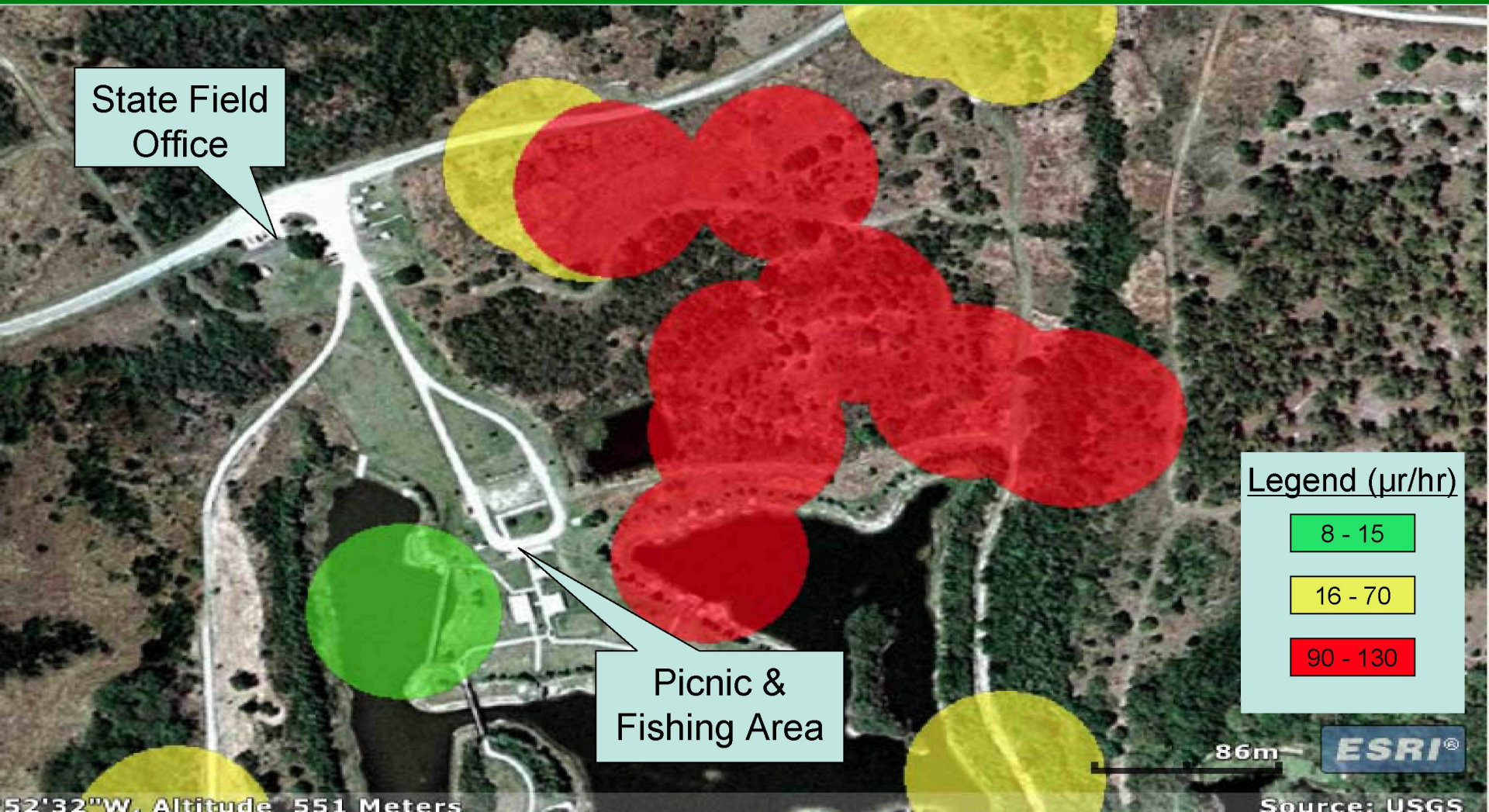
TENOROC MINE

- Post-ESI screening data indicate elevated levels of radiation.
- Radiation data suggests potential risks to current State workers ($5x10^{-3}$) and recreational users ($2x10^{-3}$).
- Future resident exposure scenario estimated at 10^{-2} risk.
- Preliminary HRS Score (w/o radiation data) 70.
- State of Florida current owner.

TENOROC MINE
PRELIMINARY RADIATION SURVEY RESULTS



TENOROC MINE
STATE OFFICE AND PICNIC/FISHING AREA



RESIDENTIAL AREAS SURVEYED BY FDOH

Subdivision Name	Gamma Radiation Range (μr/hr)	Estimated Residential Risk
Floral Lakes	12 to 33 (indoor)	$2x10^{-3}$ to $4x10^{-3}$
Christina Woods	10 to 70	$1x10^{-3}$ to $9x10^{-3}$
Mission Oaks	45 to 50	$6x10^{-3}$
West Mulberry Heights	30 to 60	$4x10^{-3}$ to $8x10^{-3}$
Imperial Lakes	6 to 50	$1x10^{-3}$ to $6x10^{-3}$
Oaks School	30 to 100	$4x10^{-3}$ to $1x10^{-2}$